

Third Eye for Blind Using Ultrasonic Sensor

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Abstract- Individuals with visual disabilities are frequently subject to outside help which can be given by people, prepared canines, or exceptional electronic gadgets as emotionally supportive networks for dynamic. The fundamental issue with daze individuals is the way to explore their approach to any place they need to go. This venture is intended to assist the visually impaired with conquering the absence of visual sense, by utilizing different faculties like sound and contact. The framework additionally comprises a ringer to produce a caution sound and to create vibration signals. The framework utilizes sound and vibration signs to advise the client about the forthcoming obstacles. As the distance between glove and snag diminishes, recurrence of both sound and vibration signal increments. Consequently, the framework assists with facilitating the routing cycle for the poor. This framework offers a minimal expense, solid, compact, low force utilization and strong answer for routes with self-evident short reaction time.

I. INTRODUCTION

The third eye for dazzle is a wearable gadget that can assist outwardly debilitated individuals with moving by themselves in an indoor environment. Visually impaired people to move from one spot to another independently. This gadget is useful particularly when the individual needs to move around a house or some indoor spots without anyone else. In this gadget, the distance of the snag is dictated by utilizing an Ultrasonic module and a Microcontroller. The snag distance is estimated and educated to the outwardly impeded individual as a ringer and vibrations. The individual can move in other bearings and stay away from crashes utilizing this. The end consequences of the work would be gloves with a wearable band joined to the gloves to which every one of the segments is

associated on a PCB, which works with serious level of precision and unwavering quality.

II. EXISTING SYSTEM

Research has been conducted for new devices and technologies to design a good and reliable and efficient system for blind or visually impaired people to detect the obstacles and warn or alert them at dangerous places or obstacles. One sound for free for travel direction and the other for blocked, it was difficult for the person to differentiate the sounds. Another problem was the system would not know the user's momentary position. Time and again there have been innovations in wearable technologies for the blind. Another Visual Impairment Aid makes use of a similar concept. We have tried to build on this existing glove by making it less complex and easily constructible so as to be marketed on a large scale. The glove presented in this also happens to be much cheaper than the Visual Impairment Aid with little to no depreciation in its performance.

III. PROPOSED SYSTEM

The proposed system deals with the cheaper and effective obstacle detection with a wide range of coverage. The device includes the following components:

- Arduino UNO
- Ultrasonic sensor
- Buzzer
- LED
- Power bank

Let us see about the components in brief:

3.1 ARDUINO ATMEGA 2560: -

The Arduino is an open-source hardware and software that can make a user to do effective operation in it. The

Arduino is a microcontroller. These microcontroller devices help in sensing and controlling the objects in the real-time situations and environment. These boards are available cheaper in the market. There are a number of inventions performed in it and still it is going on.

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. The operating voltage is 5V. Input



3.2 PIR Sensors: -

PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason, they are commonly found in appliances and gadgets used in homes or businesses. They are often referred to as PIR, "Passive Infrared", "Pyro electric", or "IR motion" sensors.



3.3 ULTRASONIC SENSOR: -

The ultrasonic sensor consists of transmitter, receiver and transceiver. The transmitter converts electrical signal into sound waves. The receiver converts the sound waves into electrical signal again. The transceiver performs both the receiver and transmitter operations. It also has crystal oscillators in it. It will

perform the stabilization operation in the ultrasonic sensor.



Figure 2: Ultrasonic sensor

3.4 PIEZO BUZZER: -

The piezo buzzer is an electronic device which generates sound through it. The buzzer is used as an indication to the user. It is used in the car reversing system and braking system as an indication. It is based on the principle of piezoelectricity discovered in 1880 by Jacques and Pierre Curie.



Figure 4: Piezo buzzer

3.5 ARDUINO SOFTWARE: -

The Arduino is the most used programming software to perform the above-mentioned operation. Using some program in the software we can do every operation.

3.6 GSM Module: -

GSM GPRS Modules are one of the commonly used communication modules in embedded systems. A GSM GPRS Module is used to enable communication between a microcontroller (or a microprocessor) and the GSM / GPRS Network. Here, GSM stands for Global System for Mobile Communication and GPRS stands for General Packet Radio Service.

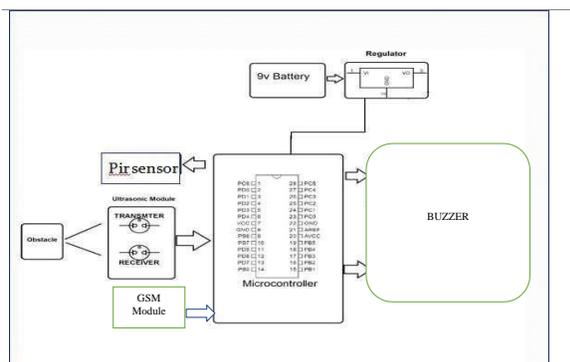
A GSM GPRS MODEM comprises of a GSM GPRS Module along with some other components like communication interface (like Serial Communication – RS-232), power supply and some indicators. With the help of this communication interface, we can connect the GSM GPRS Module on the GSM GPRS MODEM with an external computer (or a microcontroller).

GSM / GPRS Modules allow microcontrollers to have a wireless communication with other devices and instruments. Such wireless connectivity of microcontroller opens up to wide range of applications like Home Automation, Home Security Systems, Disaster Management, Medical Assistance, Vehicle Tracking, Online Banking, E – Commerce etc. to name some.

Before going in to the details about the GSM/GPRS Module, we will first see a few basic things like GSM, GPRS, MODEM, Module and System.



voltage will range from 7v to 12V. DC Current for 3.3V Pin is 50 mA. Flash Memory is 32 KB.



CIRCUIT DIAGRAM:

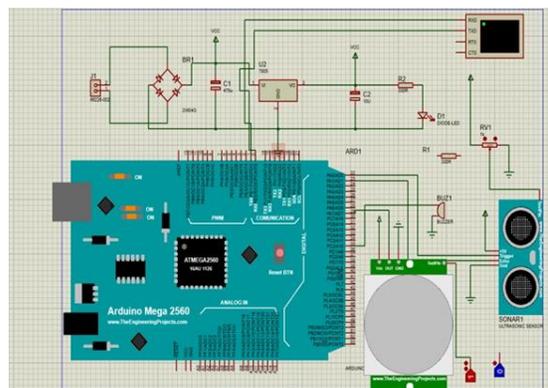


Fig.5: Circuit diagram

WORKING OPERATION:

This proposed system consists the equipment like Arduino UNO, ultrasonic sensor, bread board, buzzers for detecting the obstacles and letting the user know about the obstacle, Red LEDs, Switches, Jumper cable, power bank, Male and female header pins, some elastic and stickers to make the device wearable as a band for wearing for the users. The wiring of the device is done in a following manner. The Ground of LED, buzzer is connected to GND of the Arduino. The positive of the LED and the middle leg of switch is connected to the Arduino pin 5. The positive of the Buzzer is wired to the first leg of the switch.

The Ultrasonic sensor is wired accordingly. The Ultrasonic sensor pin VCC is connected to the Arduino pin VCC, Ultrasonic sensor pin GND is connected to the Arduino pin GND, Ultrasonic sensor pin Trig is attached to the Arduino pin 7, Ultrasonic sensor pin Echo is connected to the Arduino PIN 6. The switch used here is for selecting the mode. (Buzzer should need or not).

At the end, after all the connections are done to the Arduino board upload the code to Arduino board and power the other modules using a power bank or the power supply. The Ultrasonic sensor here used as a transceiver. The ultrasonic waves are emitted by the transmitter when the objects are detected. Both the transmitter and receiver re resent inside the ultrasonic sensor. We calculate the time interval between the transmitted and received signal. The distance between the object and sensor is calculated using this.

When we increase the distance between the object and

the sensor the coverage angle will decrease. Sensor has coverage of 60 degree. Thus, the objective is to cover a wide angle to detect the obstacles with the help of the ultrasonic sensors to help the blind and make it easy for them to move around easily without any hassle. Hence, the distance calculation is calculated and the sensor detects and the further procedure of the buzzing sound to the user is carried out.

In case if the blind person gets missing then the GSM module do its work. the location of the blind person will be sent to the contacts which are added to that GSM module

Thus, this way Third Eye for Blind will be designed for the visually impaired people and will make it very easy and convenient as it will be a wearable device

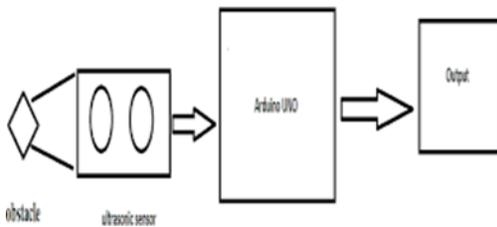


Figure 6: System module

IV. RESULTS

With the improvement of the living standards of the people, we have become so materialistic that we have forgotten how the physically disabled people live a tough life. Eyes are responsible for observing and listen the outside environment; dysfunction of such prime sense organ severely affects the knowledge perceiving capability of the outside environment. Therefore, going around to places in such an environment is a very big challenge because blind people cannot depend on their own eyes and thus face many difficulties. This project will help them to overcome their obstacles.

CONCLUSION

The objective of this project is Third Eye for the Blind is to design a product which is very much useful to those people who are visually impaired and those who often have to rely on others. The third eye for Blind project is an innovation which helps the blind person

to move around and go from one place to another with speed and confidence by knowing the nearby obstacles using the help of the wearable band which produces the ultrasonic waves which notify them with buzz sound or vibrations. It allows the user those who are visually impaired to walk freely by detecting the obstacles. They only need to wear this device as a band or cloth on their body.

Thus, this project Arduino based obstacle detect or for blind people is a new method to resolve their problems. A less complex portable, cost efficient, easy to manage an effective system with many more amazing properties and advantages are proposed to provide support for the blind. The system will be very easy to find the distance between the objects and the sensor. It can detect the objects in every direction the blind person.

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